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Description

Electrical power breaker having a connecting rail and an arcing horn

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The invention relates to an electrical power breaker having a housing and having a connecting rail accommodated in an opening in the housing, the end of said connecting rail which protrudes into the housing 10 being part of a switching contact arrangement and bearing an arcing horn which has a fixing limb resting on the connecting rail.

A power breaker of the type mentioned is described, for 15 example in DE 198 19 165 A1. In this case, a screw acts as a common fixing means for the connecting rail and the supported arcing horn, in order to simplify the assembly of these parts when producing the power breaker. This takes place by a web arranged on the 20 underside of the connecting rail being supported on the inner side of the housing, and, by this means, the position of the inner end face, which is associated with the switching contact arrangement, of the connecting rail being determined. Counter to inward 25 movement of the connecting rail, a stop bar is provided on the arcing horn, and is supported on the outside of the housing of the power breaker. The arcing horn and the connecting rail are connected to one another and at the same time fixed against being moved in both 30 directions by means of fixing means engaging in the connecting rail and passing through the supported fixing limb. For assembly purposes, the arcing horn is initially inserted in the opening, which is provided for the purpose of passing through the connecting rail, 35 of the housing, in order to position the stop bar. The connecting rail is then inserted, the level of the opening in the housing

thus corresponds to the overall level of the connecting rail and the fixing limb of the arcing horn.

5 The invention is based on the object of simplifying the assembly of the connecting rail and arcing horn and of improving the accessibility of the fixing means for the arcing horn.

10 This object is achieved according to the invention by at least one projection pointing toward the connecting rail being formed on the fixing limb of the arcing horn, and by the connecting rail having a recess corresponding to the projection.

15 This design of the connecting rail and the arcing horn makes it possible for the two parts to be brought into the relative position envisaged by means of the projection and the recess prior to assembly of the power breaker in the housing, and to assemble both of 20 them in the housing in this position. Connecting the arcing horn and the connecting rail by means of the abovementioned projection and the corresponding recess makes it possible to select fixing means engaging with the connecting rail. This has the advantage that the 25 fixing means can be attached at a point which is more effectively protected against the influence of switching arcs.

30 The projection provided on the fixing limb of the arcing horn may in the context of the invention be in the form of a bent-back edge, the recess provided for accommodating the projection being in the form of a groove. In particular when, according to a further feature of the invention, the fastening limb is as wide 35 as the connecting rail,

and the bent-back edge extends over the entire width of the fixing limb and the recess extends over the entire width of the connecting rail, a stable connection, which thus corresponds to the operational requirements, 5 is achieved between the arcing horn and the connecting rail. The opening provided in the housing for the power breaker for the purpose of accommodating the connecting rail, as is also the case with the arrangement according to the abovementioned DE 198 19 165 A1, be 10 dimensioned such that the connecting rail and the fixing limb of the arcing horn are at the same levels. However, instead of this, according to a further development of the invention, the opening in the housing may be matched to the cross-sectional form of 15 the connecting rail, and a collar which covers the fixing limb of the arcing horn at the top and at the sides may be integrally formed on the housing. Such a collar can be designed such that it extends in the vicinity of the arc-guiding part of the arcing horn and 20 thus prevents a movement or movement.

As has already been mentioned, the invention avoids fixing means which pass through the fixing limb of the arcing horn. For common fixing purposes, it is 25 recommended to provide on the connecting rail an integrally formed web in the form of a stop means on the housing, as is already known from DE 198 19 165 A1. This web is gripped and pushed against the housing by fixing means which can be operated from the outside of 30 the housing.

The invention is described in more detail below with reference to the exemplary embodiment illustrated in the figures.

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Figure 1 shows a section through a region of a low-voltage power breaker which is essential to the invention.

Figure 2 shows an enlarged, perspective illustration of a detail of a housing of the low-voltage power breaker shown in figure 1.

5 The low-voltage power breaker 1 shown in figure 1 has, in a known manner, a housing 2 having a rear wall 3 and preferably two or more switching contact arrangements 4. A drive device 5 serves the purpose of simultaneously actuating the switching contact arrangements 4. These each have a contact carrier 6 and a contact lever 7 arranged thereon such that it can move counter to the spring force. Contact pieces or contact faces interacting with the contact levers 6 are fitted to an upper connecting rail 10 which projects 15 into the housing 2 and bears an arcing horn 11. Located above the switching contact arrangements 4 are arc-quenching chambers 12. In addition to the abovementioned upper connecting rails 10, lower connecting rails 13 which are connected to the contact 20 levers 7 by means of flexible conductors 14 serve the purpose of connecting the switching contact arrangements 4 to an external circuit.

In addition, figure 1 shows a screwless connection of 25 the arcing horn 11 to the upper connecting rail 10. The arcing horn 11 has a horn element 15, which serves the purpose of guiding switching arcs, and a fixing limb 16. The end of the fixing limb 16 is provided with a projection 17, which is in the form of a bent-back 30 section, a recess 20 in the form of a groove being fitted to the upper side of the connecting rail 10 for the purpose of accommodating said projection 17. The fixing limb 16 and the connecting rail 10 have the same width. The recess 20 correspondingly extends over the 35 entire width of the connecting rail 10.

Further details and the procedure for assembly can be seen in more detail in figure 2 which shows an enlarged, perspective illustration of the region of the upper connecting rail 10 and the arcing horn 11. As is indicated by an arrow 21, for the purpose of connecting it to the connecting rail 10, the fixing limb 16 of the arcing horn 11 is brought to bear over a large area on the upper side of the connecting rail 10 such that the projection 17 is inserted into the recess 20 in the form of a groove. This assembly is then inserted into an opening 23 in the direction of a further arrow 32, said opening 23 being provided in the rear wall 3 of the housing 2 of the power breaker 1. In this case, the opening 23 matches the connecting rail 10. In addition, a collar 24, which covers the fixing limb 16 and also overlaps the said fixing limb 16 laterally with lateral side pieces 25, is integrally formed on the rear wall 3 above the opening 23.

For the purpose of finally fixing the connecting rail 10 to the arcing horn positioned on it, fixing means are provided which are accessible on the outside of the housing 2 or the rear wall 3. The arrangement of the fixing means can be seen in more detail in figure 1. Figure 1 shows how a web 26 arranged on the underside of the connecting rail 10 is gripped by a nut 27 in the form of a pressure piece. A retaining screw 30 which passes through the rear wall 3 engages in the nut 27 and presses the connecting rail 10 by means of its web 26 on the inside against the rear wall 3. In this case, a head 31 of the retaining screw 30 is located on the outside of the rear wall 3 and is thus easily accessible for use. The fixing limb 16 of the arcing horn 11, on the other hand, is free of fixing means and is largely covered and protected on its upper side by the collar 24.

The further parts of a switching pole of a low-voltage power breaker of those parts shown correspond to a conventional physical design as are described, for example, in EP 0 898 779 B1 and are therefore not 5 described in any more detail.

The recess 20 in the connecting rail 10 may expediently be introduced when the connecting rail 10 is produced by means of profiling, in the same manner as the web 10 26. It is therefore tolerable to produce the recess 20 by separately machining the connecting rail 10.